

Patent Appl. No. 08/808,315
Amdt. Dated September 17, 2003
Reply to Office Action of June 19, 2003

Attorney Docket No. 81880.0087
Customer No. 26021

REMARKS/ARGUMENTS:

Claims 20-22 are pending in the application. Reexamination and reconsideration of the application, in view of the following remarks, are respectfully requested.

The present invention relates to a sapphire monocrystal provided with a smooth cleavage plane, more particularly, to a monocrystal sapphire substrate easier to cleave, so as to be used as a substrate, of thin film growth, such as semiconductor or the like, for electronic parts or structure parts, and to a method of working the same. (Applicant's specification, at p. 1, lines 9-15).

CLAIM REJECTIONS UNDER 35 U.S.C. § 103:

Claims 20 and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hosoi et al. (U.S. Patent No. 4,908,074) in view of Setsune (JP 61121042). The Applicant respectfully traverses this rejection. Claim 20 is as follows:

A sapphire monocrystal plate comprising a sapphire monocrystal having a major face, a working reference plane on a peripheral edge of the plate, the working reference plane being substantially parallel or perpendicular to a plane R of the sapphire monocrystal, wherein the major face is a plane A or a plane C of the sapphire monocrystal and has a surface roughness (Ra) of 0.1 μm or less.

Applicant respectfully submits that Hosoi and Setsune cannot render claim 20 obvious, because Hosoi and Setsune fail to teach or suggest a plane of a sapphire monocrystal that has a surface roughness of 0.1 μm or less. An object of the present invention is to provide a sapphire monocrystal having a smoother division plane higher in precision, and a monocrystal sapphire substrate. (Applicant's

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specification, at p. 4, lines 7-10). It is the discovery of the present invention that it is preferable to have major plane 11 have a surface roughness of 0.1 μm or less. If major plane 11 is rough, it interferes with the crack growth of the microcrack line formed due to the existence of innumerable crack lines on the surface. (Applicant's specification, at p. 15, lines 3-11; Figures 4A-B, 5A-B).

Hosoi teaches a process for the vapor deposition of a semiconductor of a compound of elements of the groups III.V, in which formation of lattice defects in the interface between an alumina single crystal substrate and a film of a semiconductor of a compound of elements of the groups III.V is controlled and even if a compound semiconductor film having a relatively small thickness is formed, a high electron mobility is attained. (Hosoi, column 2, lines 5-13). Accordingly, in Hosoi, a film of a gallium-arsenic semiconductor is formed on a single crystal sapphire substrate. The surface of the film of the gallium-arsenic semiconductor has such a smoothness that the maximum height roughness is smaller than 0.1 μm . (Hosoi, column 2, line 59-column 3, line 2). Therefore, Hosoi teaches that it is the gallium-arsenic film that has a roughness of 0.1 μm or less. Hosoi is silent as to the surface roughness of a plane of a sapphire monocrystal.

Setsune cannot remedy the defect of Hosoi and is not relied upon by the Office for such. Instead, the Office cites Setsune for teaching that it is known to cleave an R plane of a sapphire monocrystal.

In light of the foregoing, Applicant respectfully submits that Hosoi and Setsune could not have made claim 20 obvious, because the combination of references fails to teach or suggest each and every claim limitation. Claim 21 depends from claim 20 and cannot be made obvious for at least the same reasons as claim 20. Withdrawal of these rejections is thus respectfully requested.

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Claim 22 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hosoi and Setsune as applied to claims 20-21 above, and further in view of Nitta et al. (U.S. Patent No. 5,403,773). The Applicant respectfully traverses this rejection.

Claim 22 depends from claim 20, and as such includes all the limitations of claim 20, and therefore, cannot be rendered obvious over Hosoi and Setsune, for the same reasons as discussed above. Nitta cannot remedy the defect of Hosoi and Setsune and is not relied upon by the Office for such. Instead, the Office cites Nitta for teaching that a wafer is scribed along cleavage lines and this scribing will inherently form a microcrack.

In light of the foregoing, Applicant respectfully submits that the cited references could not have made claim 22 obvious, because the combination of references fails to teach or suggest each and every claim limitation. Withdrawal of this rejection is thus respectfully requested.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, in view of the foregoing remarks, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6810 to discuss the steps necessary for placing the application in condition for allowance.

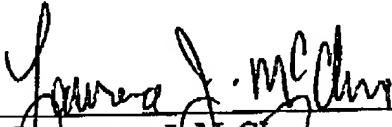
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Respectfully submitted,
HOGAN & HARTSON L.L.P.

Date: September 17, 2003

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